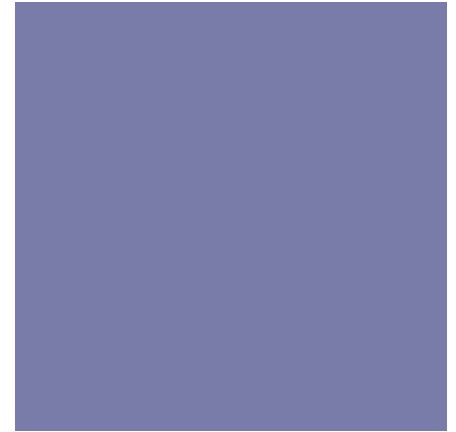




Security

WHAT IS THE PROBLEM AND WHY

Sept. 2019



Human-Centered Security

L Jean Camp

New Kinds of Vulnerabilities

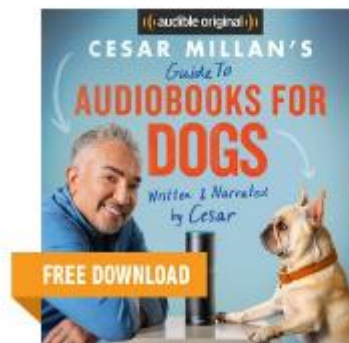
- New participants
- No literacy or tech ability assumptions
- Complex interactions

AUDIBLE FOR DOGS

MAKE YOUR DOG'S DAY

We teamed with dog behaviorist Cesar Millan to show you how listening can make your dog calmer and happier.

WATCH NOW 

A promotional image for the Audible for Dogs campaign. It features Cesar Millan, a man with grey hair wearing a blue button-down shirt and maroon pants, sitting on the floor. He is surrounded by four dogs: a small white and tan dog, a medium brown and white dog, a small golden retriever, and a large golden retriever. To the right of Cesar is a small white table with a black Audible speaker on it. The background is white with a yellow soundwave graphic.

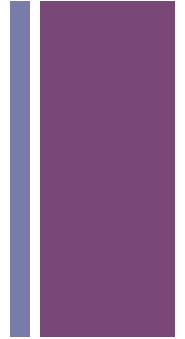
DOWNLOAD THE FREE AUDIOBOOK

Calmer dogs. Happier dogs. Seriously.

In our recent study, 3 out of 4 dog owners reported a positive change in their dog's behavior after playing an Audible book for their dog.*

[Download the audiobook >](#)

+ An Attacker



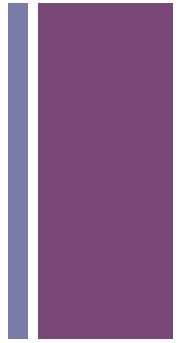
- Uses your fridge to steal the password to your Google Calendar
- Learns when you will be home
- Sets fire to your house
- Causes your door locks to trap you inside
- Watches you from your webcam as you and your loved ones call for help
- And blocks those calls with a DDoS

+ Happily

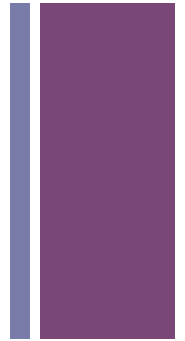
- No one is that evil.



- At least not yet.



+ Sadly



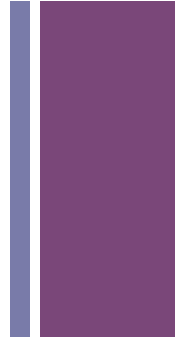
That is the state of the market

Why?

Why the Lack of Security?

- It's not war
- It's business

+ Why Not Demand Security?



- People do not care about the risk
- People do not know about the risk
- People know and care



Why Not Improve?

- People do not care about the risk
 - They need incentives & economics
- People do not know about the risk
 - They need risk communication
- People know and care
 - They require usable technology

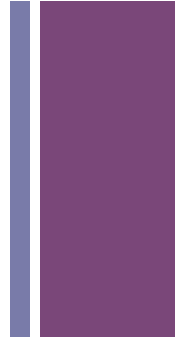


People Don't Care

It's the economy

Solve the problem by
redefining it as an
economic challenge.
Change the game.

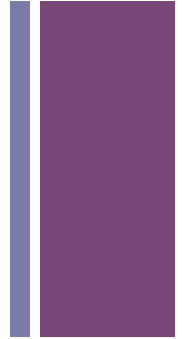
+ Mobile Lemons



- Resource management
 - Real time resource requests
 - Machine learning revealed preferences
- Moment of purchase
 - Benefit information
 - Community ratings
- Previously
 - Permissions manifest



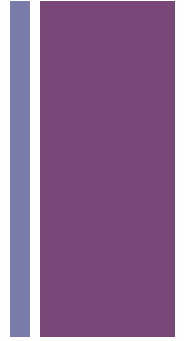
+ IoT with More Lemons



- Integrates mobile interactions
- Permissions information only on app
- No security or privacy information at moment of purchase
- Limited interoperability information
- No source of personalized systems risk information



+ Risk Information



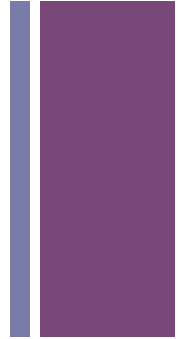
- Security is a risk
- Privacy is a risk
- It is a risk where the seller has complete information
- The buyer cannot distinguish between low risk & high risk

+ What is a Over Privileged?

- No value in most over privileging
 - Not behavioral advertising
- Only costs
- No benefits
- No data use

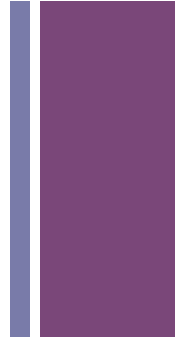


+ Permission Types



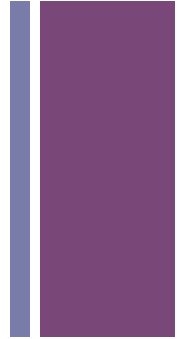
- Normal
 - Defined as being harmless
- Dangerous
 - Spending money
- Signature/Systems
 - Only to apps signed with device manufacturers permission

+ Permissions Demystified



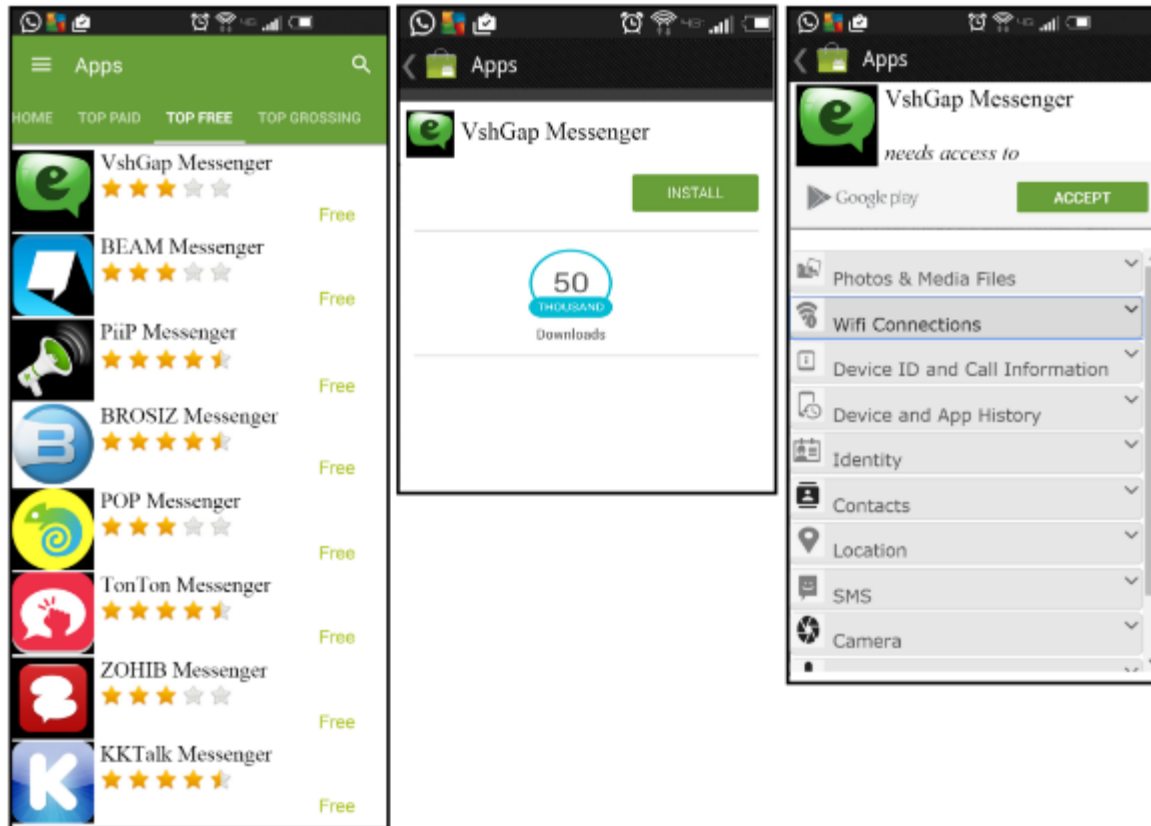
- Android permissions inadequate to map to functionality for developers
- Over privileging
 - Over one third are over-privileged
 - Many requested inoperable permissions

+ Measures

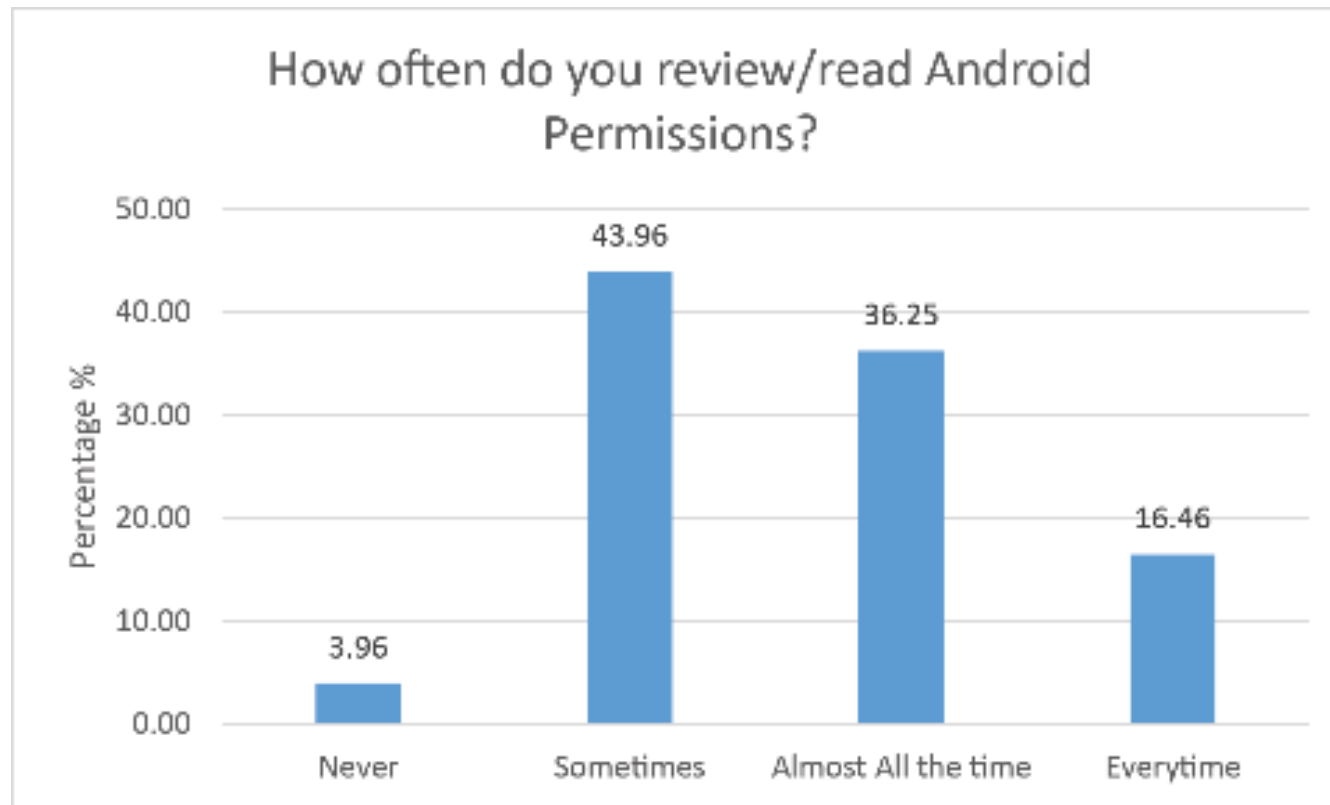


- Applications are designed to belong to 8 different types based on
 - Download count
 - Rating (benefit)
 - Risk (permissions)
- Select four per category

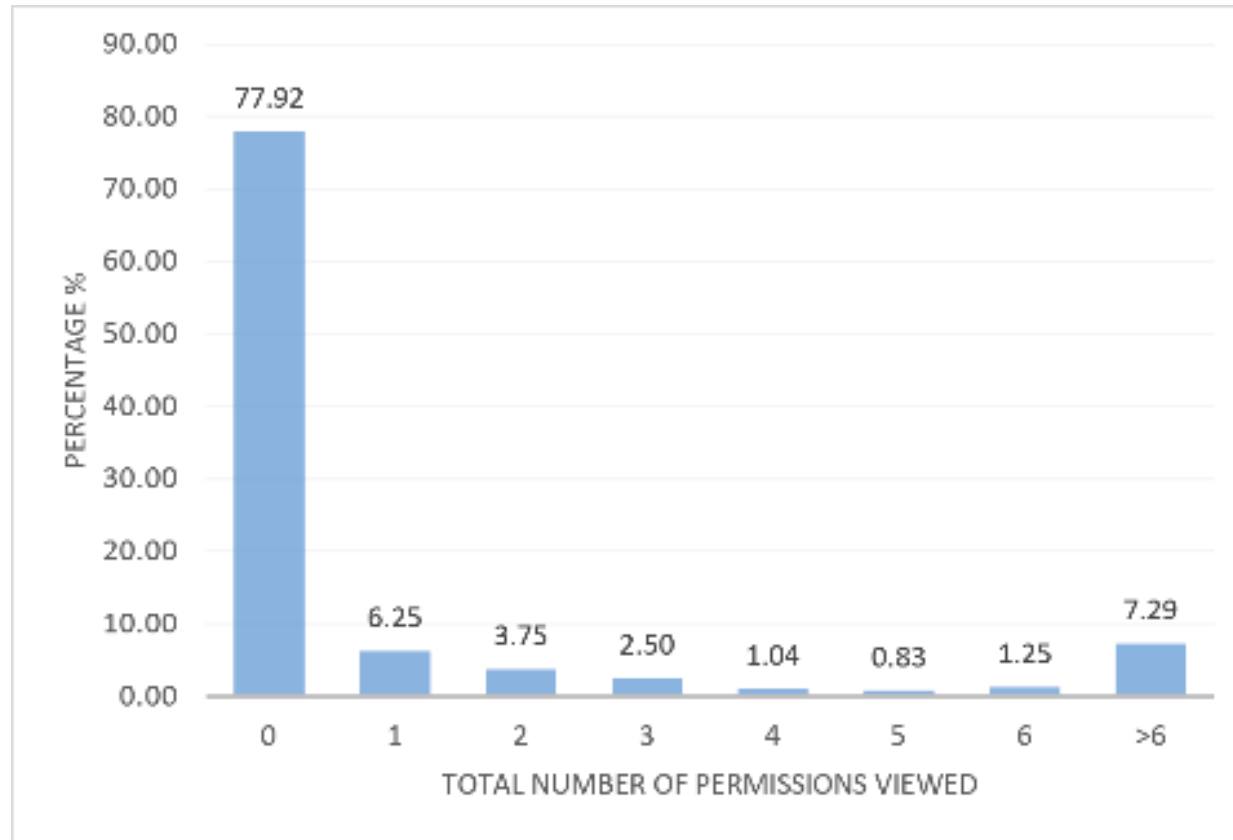
+MTurk



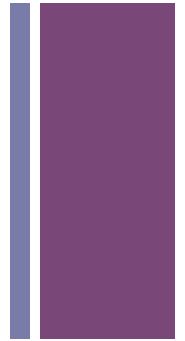
+ Expressed Preferences



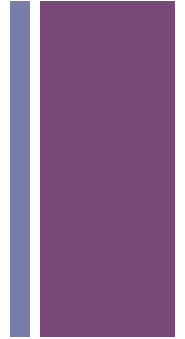
+ Revealed Preferences



+ Comprehension

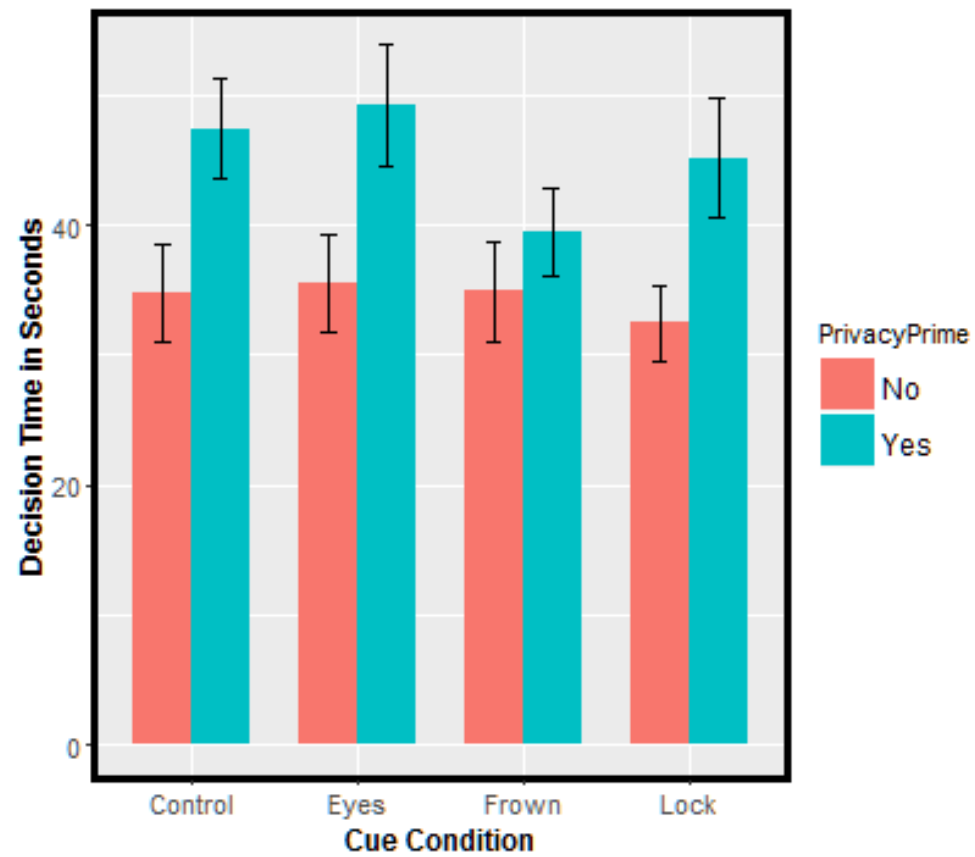


+ Procedure

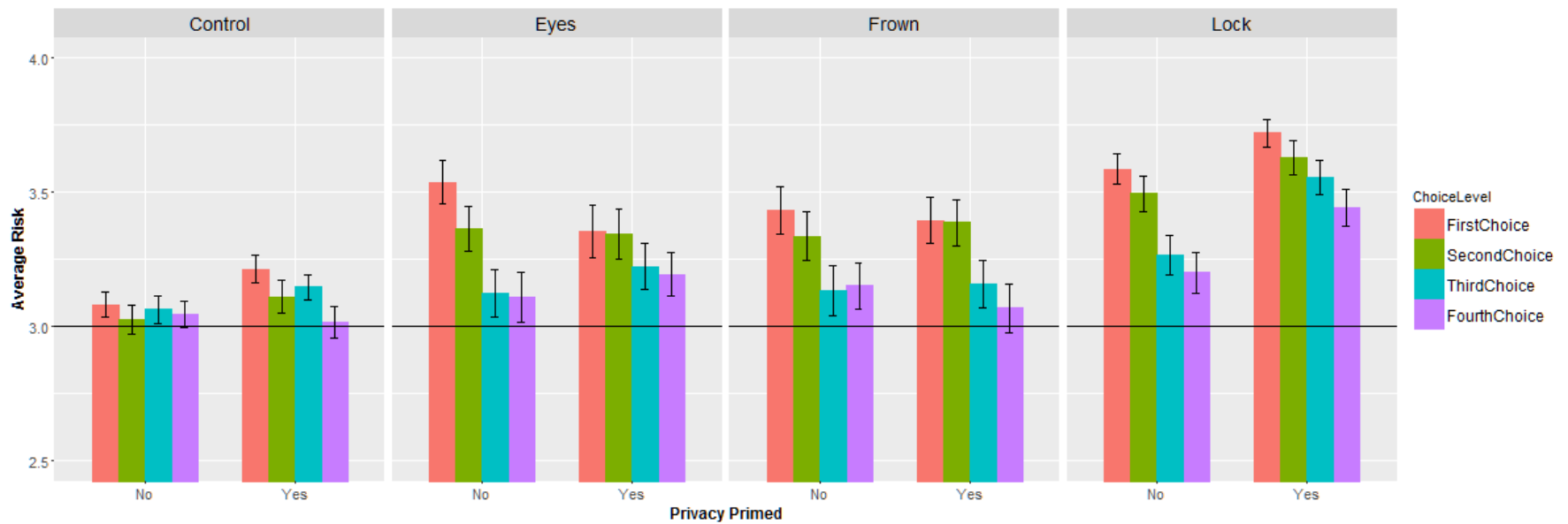
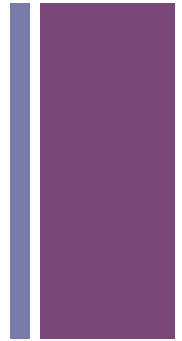


- Amazon MTurk
- Two groups
 - Privacy survey for priming purposes
 - No privacy survey
- Four groups choose apps
 - Control, social signals, risk signals, privacy signal
- Questionnaire at the end
 - Permission use and comprehension
 - Demographics

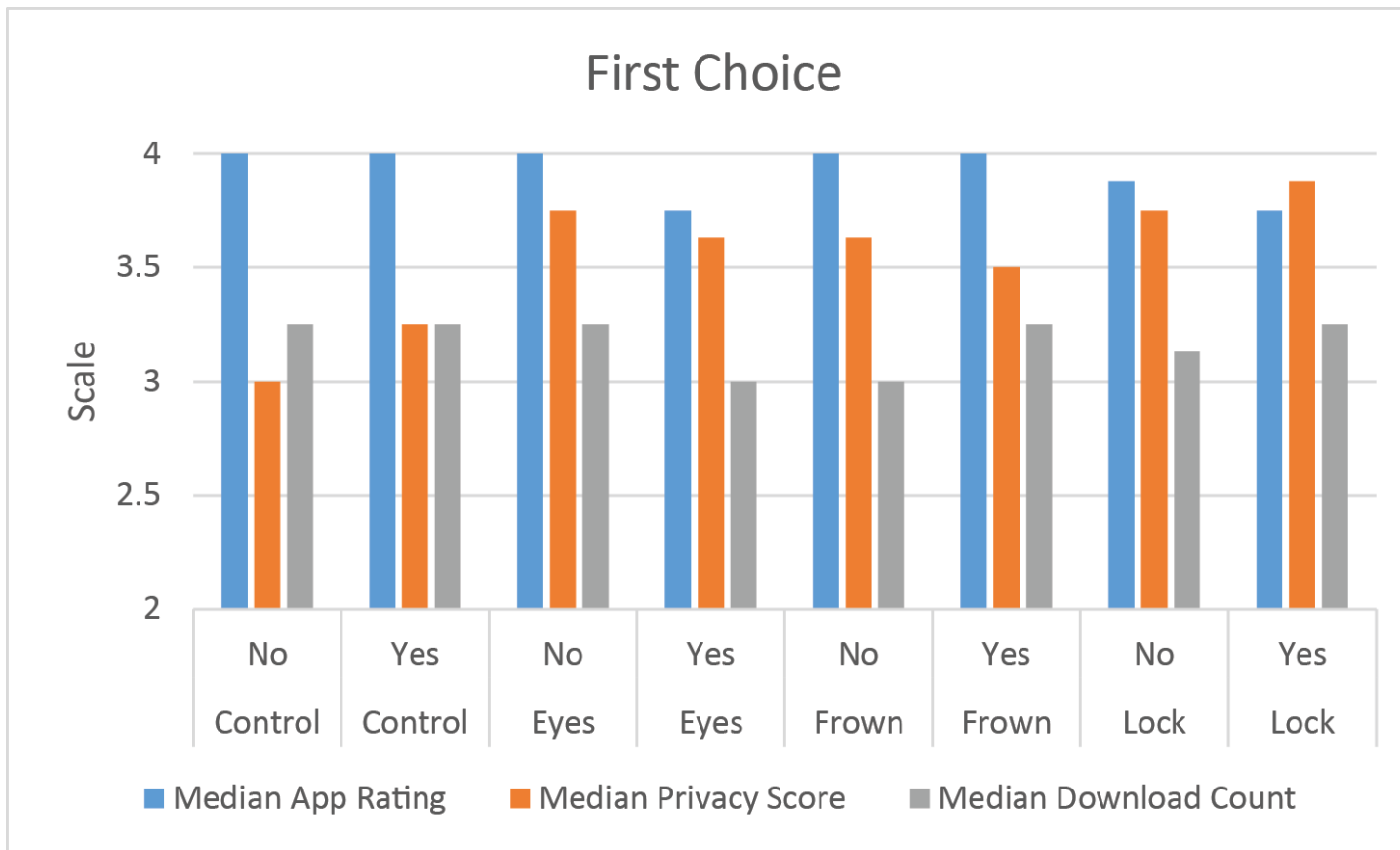
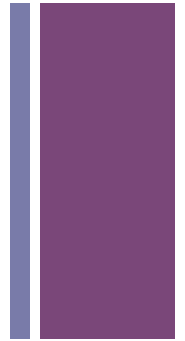
+ Decision Time



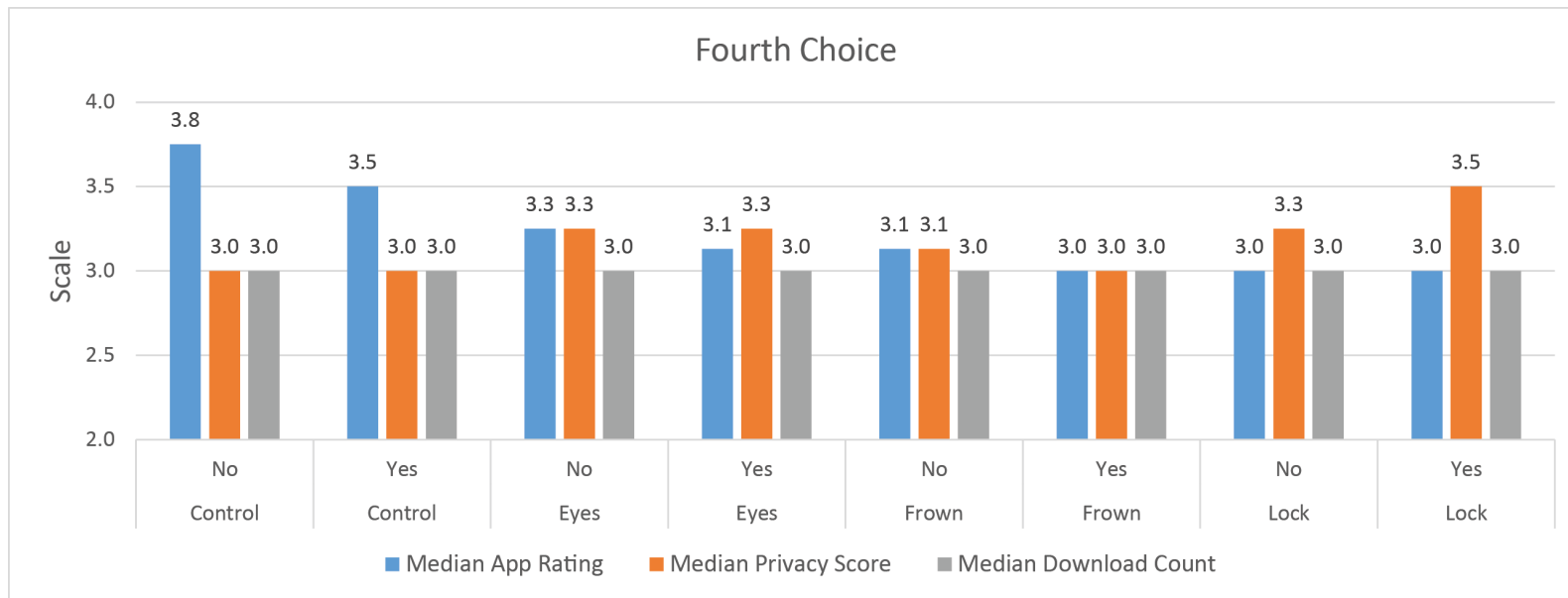
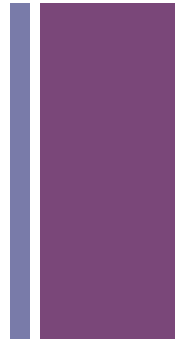
+ Mean Privacy Rating Higher is More Privacy



+ Easy Choices

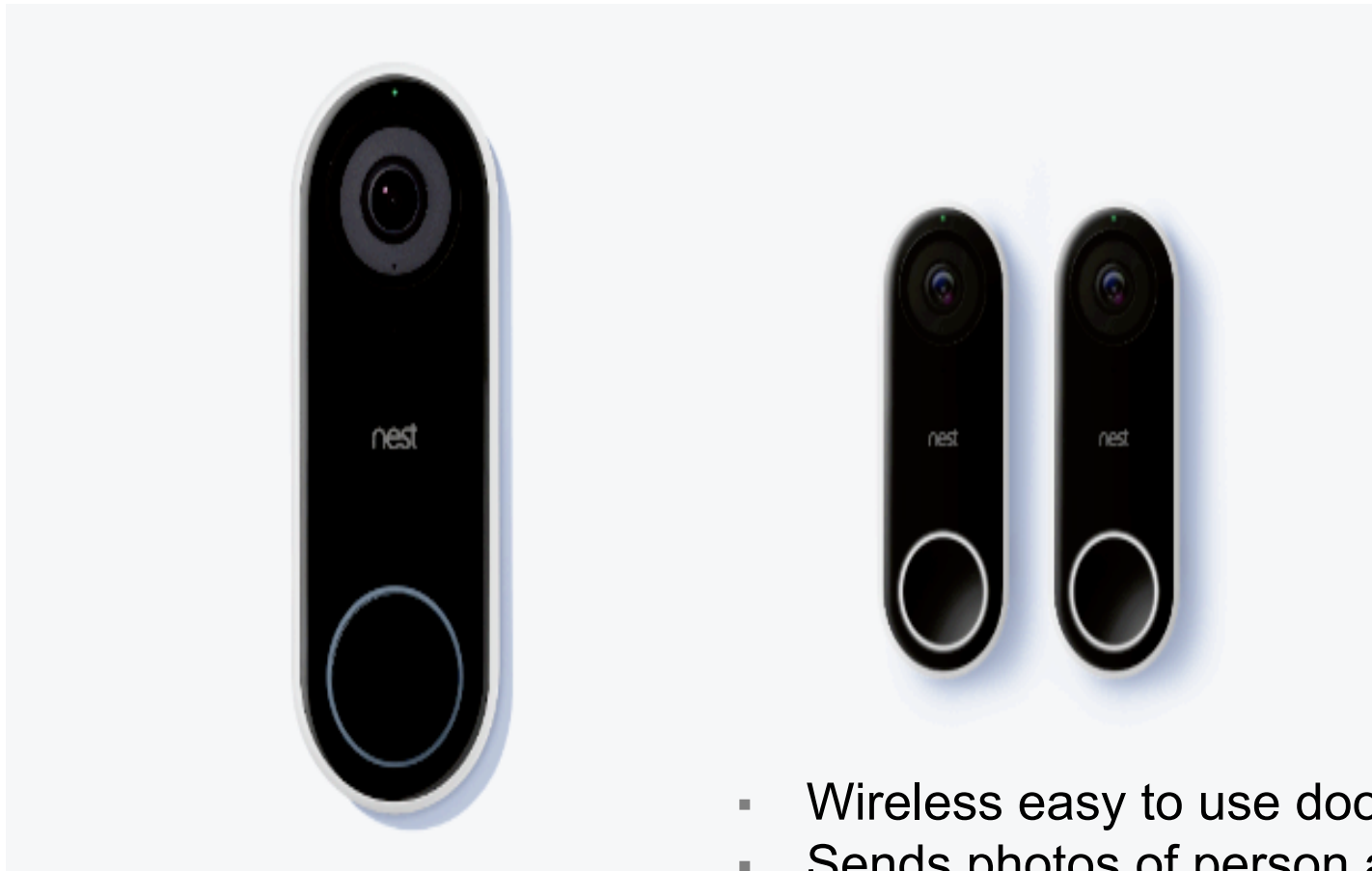


+ With Trade Offs



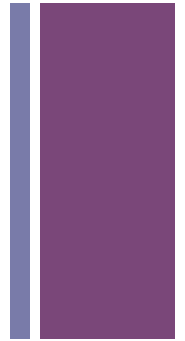
How many of you read
privacy policies?

+ Consider a Doorbell



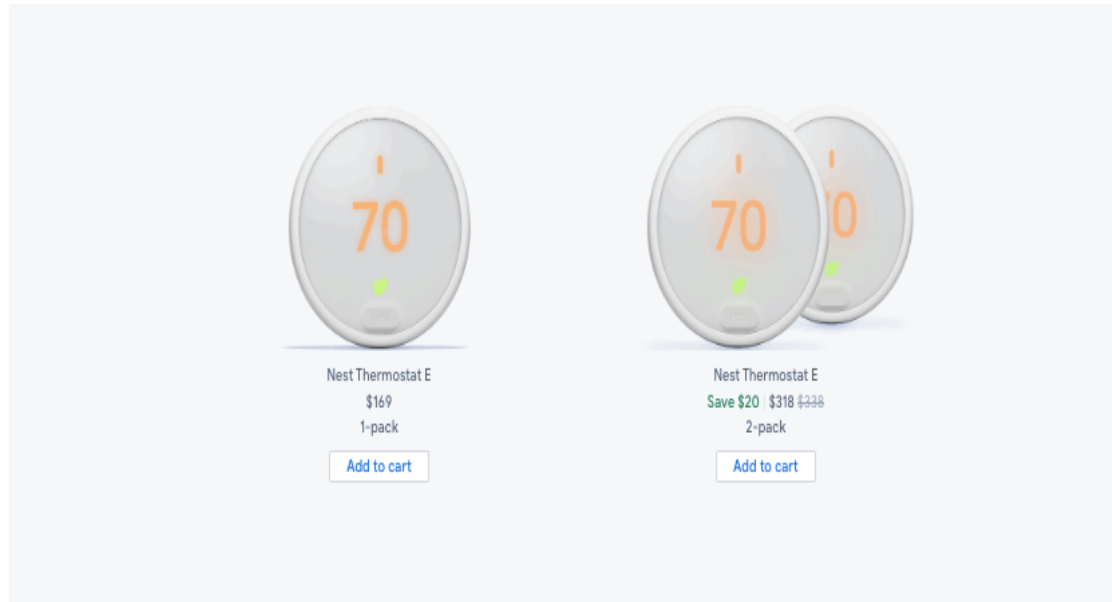
- Wireless easy to use doorbell
- Sends photos of person at door

+ It's Actually Complicated



- Home security, personalization, remote access, sharing moments, caregiving, delegating access

+ Example of Multiple Services



Google Store

Placing an order Financing
Shipping options Device recycling
Tracking a package Sustainability
Country availability Gift returns
Repairs Refurbished
Find a Nest Pro



United States

Privacy

Google Nest Commitment to Privacy

Sales Terms

Terms of Service

Careers

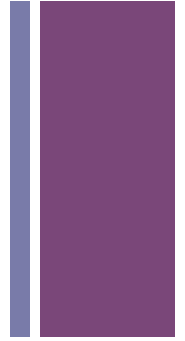
+ Privacy Policy and Data Use

2500 words

Six Links

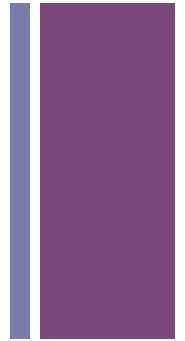
- [privacy and security principles](#)
- how [our connected home devices and services](#) work
- [Learn more](#) about sensors in our devices.
- Google settings to [control the ads you see](#),
- learn more about the Google Assistant and the choices available to you [here](#).
- Google's [Privacy Policy](#) (~4000 words)

+ Voice, Video, Face Recognition



- Next Hub Max
 - Next Cam
 - Face Match
 - Quick Gestures
- Nest Aware
 - Stores video associated with your Google Account

+ Exploring Modular Privacy Policies



Modular Facebook Privacy Policy

Agree to only those services you require and unnecessary data will not be collected

Agree to use all Facebook services

☐ By selecting this, you agree to use all the services offered by Facebook and agree to allow collection of all related data for offering these services.

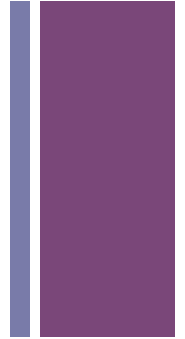
Agree to use basic Facebook services

☐ By selecting this, you agree to use all the basic services offered by Facebook and agree to allow collection of all related data for offering these services.

The following services qualify as basic services and user needs to agree to use the Facebook Platform

- Collection of any data provided by the user. (Birthdate, School/College/University, occupation, Gender etc.)
- Collection of activity data related to the user which involves commenting, liking and sharing of posts

+ Per Service Privacy Policy



- Reduce **information asymmetry** through awareness
- Allow **flexibility** in user choice
- Enable **control over information**

+ Privacy Could be a Real Peach



But People
Must Be Able
to Pick



People Don't Know

Risk Communication

**Solve the problem
creating useful, timely,
actionable risk
communication**



Risk Communication
must work for your
user population

Actual Humans

+ Design for Humans Requires Designing for Humans

Smoking is a factor which contributes to lung cancer. Most cancers that start in lung, known as primary lung cancers, are carcinomas that derive from epithelial cells. Depending on the type of tumor, so-called paraneoplastic phenomena may initially attract attention to the disease. In lung cancer, these phenomena may include Lambert-Eaton myasthenia syndrome (muscle weakness due to auto-antibodies), hyperkalemia, or syndrome of inappropriate antidiuretic hormone (SIADH). Tumors in the top (apex) of the lung, known as Pancoast tumors, may invade the local part of the sympathetic nervous system, leading to changed sweating patterns and eye muscle problems (a combination known as Horner's syndrome) as well as muscle weakness in the hands due to invasion of the brachial plexus.

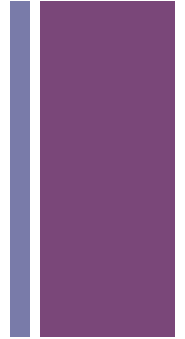
Warnings for the average user miss half your population

+ Security is Risk

Risk Perception and Communication Unplugged: Twenty Years of Process 1995

Baruch Fischhoff

+ Goal of Risk Communication



■ Change behavior

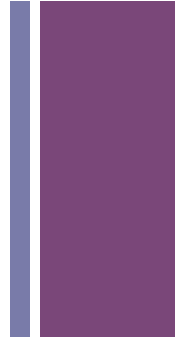
- All we have to do is show them that they've accepted/rejected similar risks in the past
- All we have to do is show them that it's a good deal for them

■ Create a Partnership

- The right coverage for the right context



+ First Identify Risk



- Modular architecture to identify risk
 - White list/black list
 - Domain names, certificates, scripts, networks
 - Reputation
 - Domain names: familiarity, history, linear over time
 - Certificates: decision tree with observation & attributes
 - Scripts: familiarity, publisher
 - Network connection: familiarity, politics

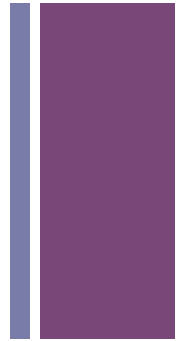
+ Second, Communicate Risk

- Model users
- Communicate mental models
- Be nice





Third, Enable Risk Mitigation

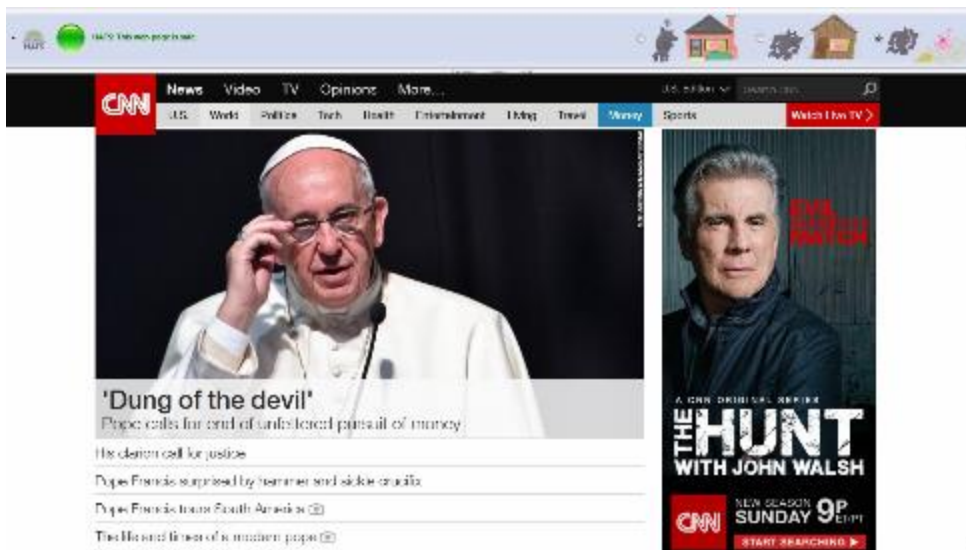


- High Risk
 - No action
- Medium Risk
 - Domain names, Certificates
 - Script
 - Block black list
 - Block categories
 - Networks
 - Warn unencrypted
- Low Risk
 - Domain names, Certificates
 - Script
 - Block all but white list
 - Blocked images, plug-in, videos, redirects, JavaScript
 - Networks
 - No passwords unencrypted

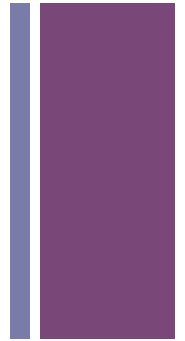
Use mental models
End to end risk
measurement

+ Empower Informed Choice

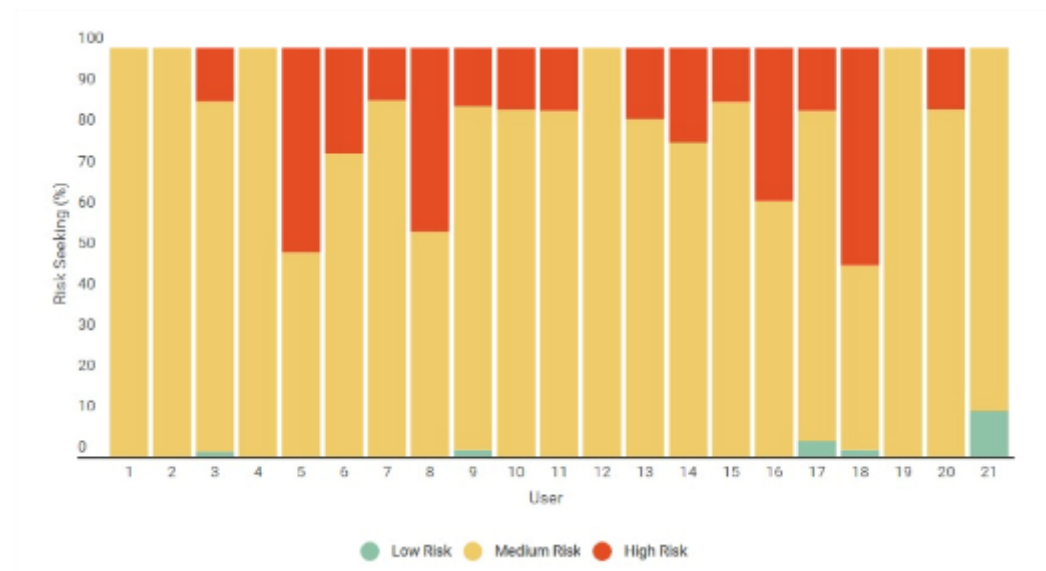
- The communication is the control
 - Simple controls
 - For one person one button was too much!



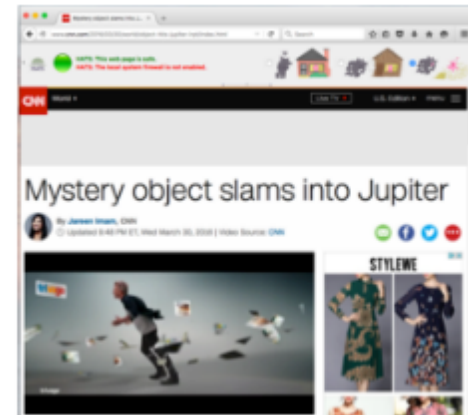
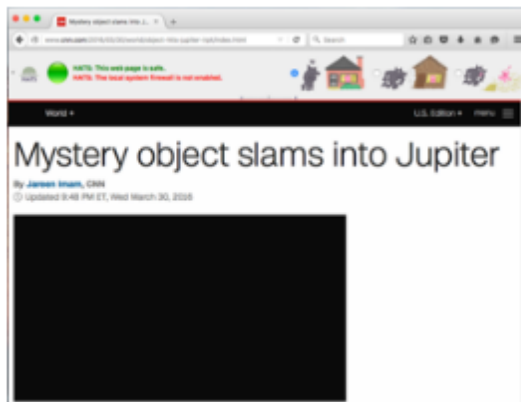
+ Behavior Changed



- Changed human behavior: Cumulative Risk Reduction
 - Most people changed settings
 - Browsed at different risk level
 - Large number of scripts blocked, certs rejected
 - Settings recalled at per-site basis

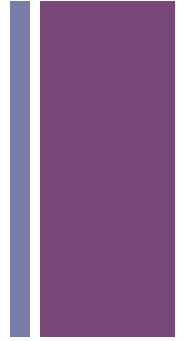


+ Clear Risks & Benefits



I am the pig. That Pig is dead.

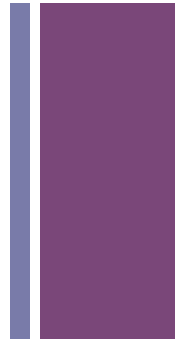
+ Communicate Risks & Benefits



- In a manner that aligns with the mental model of the communication recipient
- Easy to process
- Create an emotional response



Create Benefits



- Requirements
 - length, control, caps, #'s
 - Reduced reuse risk
 - High account capture risk



- Requirements
 - Shorter password
 - Increased reuse risk
 - Moderate capture risk



- Requirements
 - PIN
 - High PIN reuse risk
 - Low capture risk

Create Benefits

+ Physical Space Mental Model



+ Bodily Risk Mental Model





People Just Can't
Usability

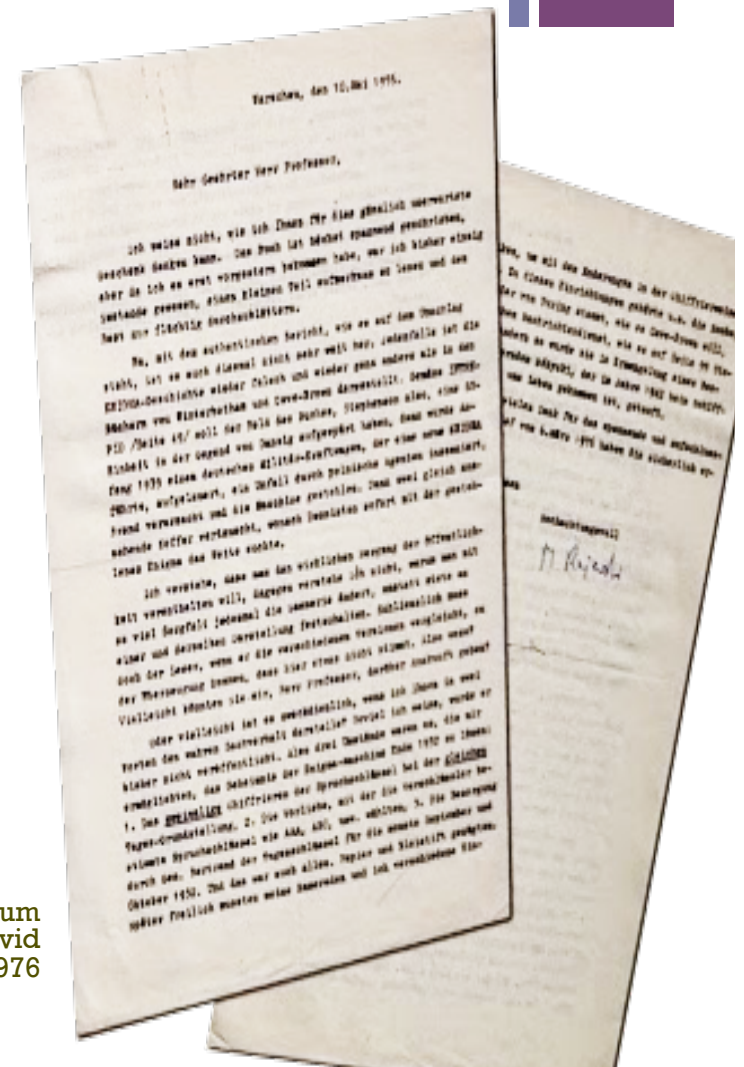
Solve the problem by
empowering people to
protect themselves

+ Usability Is Not New

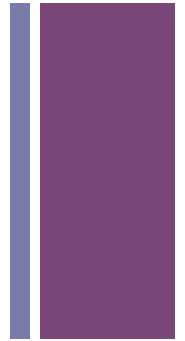
1939: three circumstances that enabled them to solve ENIGMA.

1. Double encoding of the message key
2. The cryptographers' preference for certain specific message keys such as AAA, ABC, etc.
3. General Bertand's acquisition of the daily key for the months of September & October 1932

Courtesy National Cryptologic Museum
Letter from Marian Rejewski to David
Khan May 10, 1976



+ People Change Slowly



2015: Most popular Ashley Madison passwords

- 123456

Coming in at 120,000 users (~1%)

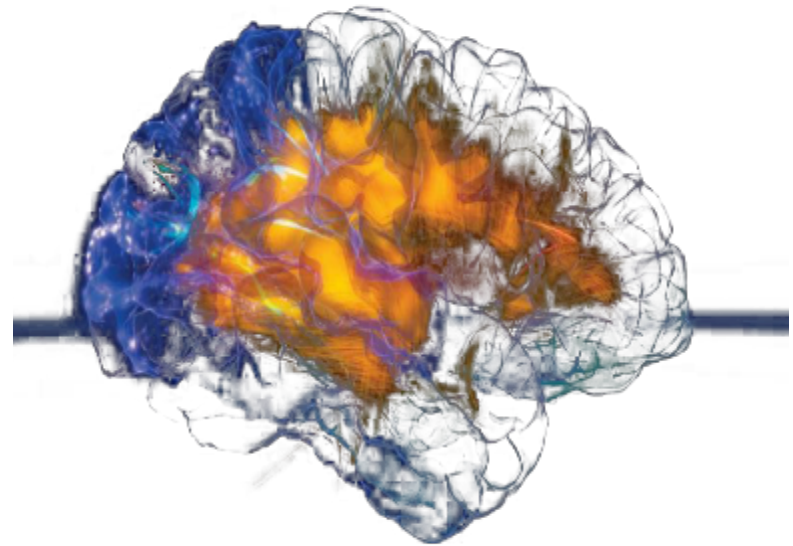
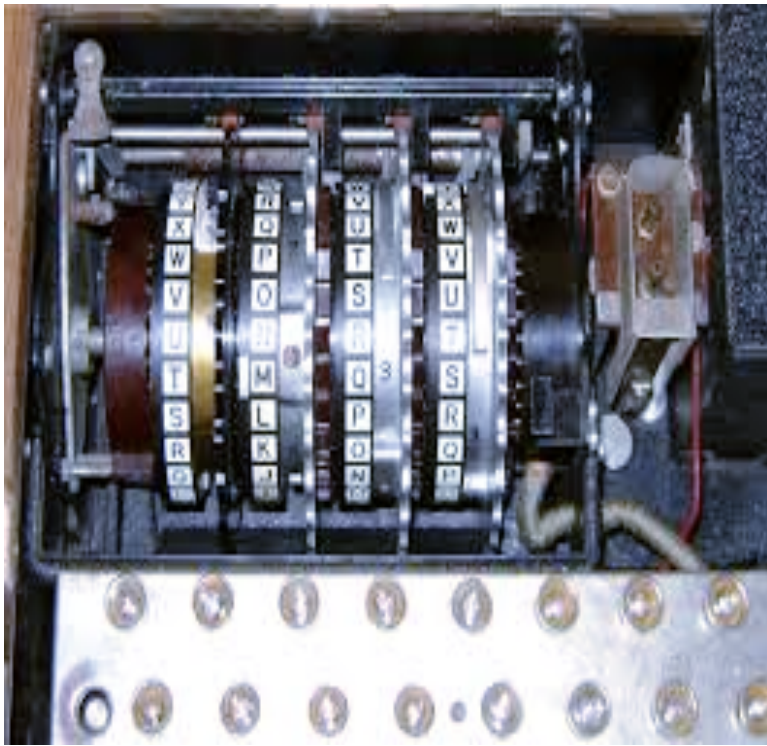
- 1234

With 48,425

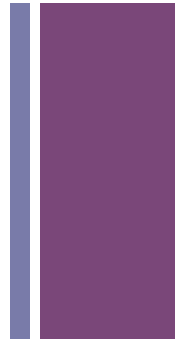
- 1234567, 12345678, 123456789

Also in top ten

+ The Human Interface Will Remain a Challenge



+ Use What We Have

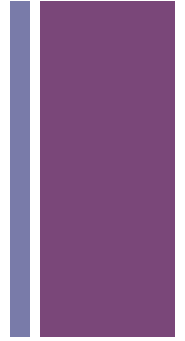


- Providing the technology is not enough
- Communicate why, then how
- We have methods, use them!
 - Risk communication and rewards
 - Usability design guidelines and evaluations
 - Treat people as participants



+ Usability Checklist

(Molich & Neilson)



- Simple, natural dialogues
- Speaker the user's language
- Minimize the memory load
- Be consistent
- Provide Feedback
- Clearly Mark exits
- Shortcuts
- Good error messages



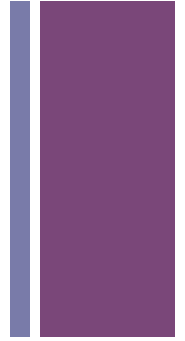
Usability Checklist for Security

(Norcie & Camp)



- Installation precedes operation
- Ensure accurate awareness of trade-offs
- Say why, not how

+ Multilayer Solutions



■ Identify Risk

- Human watchers in the loop
- Combine large scale with local

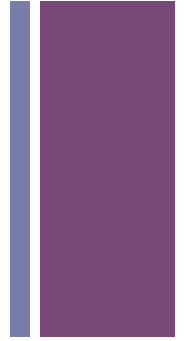
■ Mitigate Risk

- Limit centralized trust
 - Prune roots
 - Trust your history

■ Communicate risk

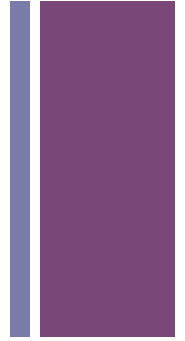
- Empower people so they can avoid risk

+ Don't Look At Averages



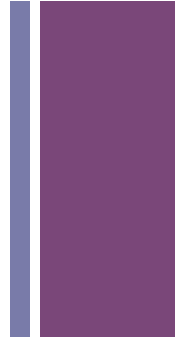
- Design for the most vulnerable
 - Targeting an average user misses half by design
- Watch vulnerable communities
 - Vulnerabilities often occur there first
 - Gamergate was a test run
 - Solutions for stressed people

+ Build for Busy People







































- Respect cognitive limits
- Say why, not just how
- Create good defaults
- Respect and learn from failures

+ The Cue Matters

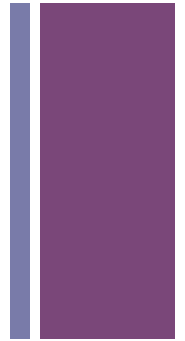


- Losing Eyes & Emoticons
 - First and second choices there is evidence
 - More eyes was worse
- Gaining Locks
 - More consistent effect
 - Stronger effect of priming on first and second
 - In the same order as benefits

+ Modified Play Store

	Google Korean Input Google Inc. ★★★★★	    	Update
	Google Pinyin Input Google Inc. ★★★★★	    	Update
	Hangouts Google Inc. ★★★★★	    	Update
	Chrome Browser - Google Google Inc. ★★★★★	    	Installed
	Gboard - the Google Keyboard Google Inc. ★★★★★	    	Installed
	Google Google Inc.	    	

+ Actual Store Values

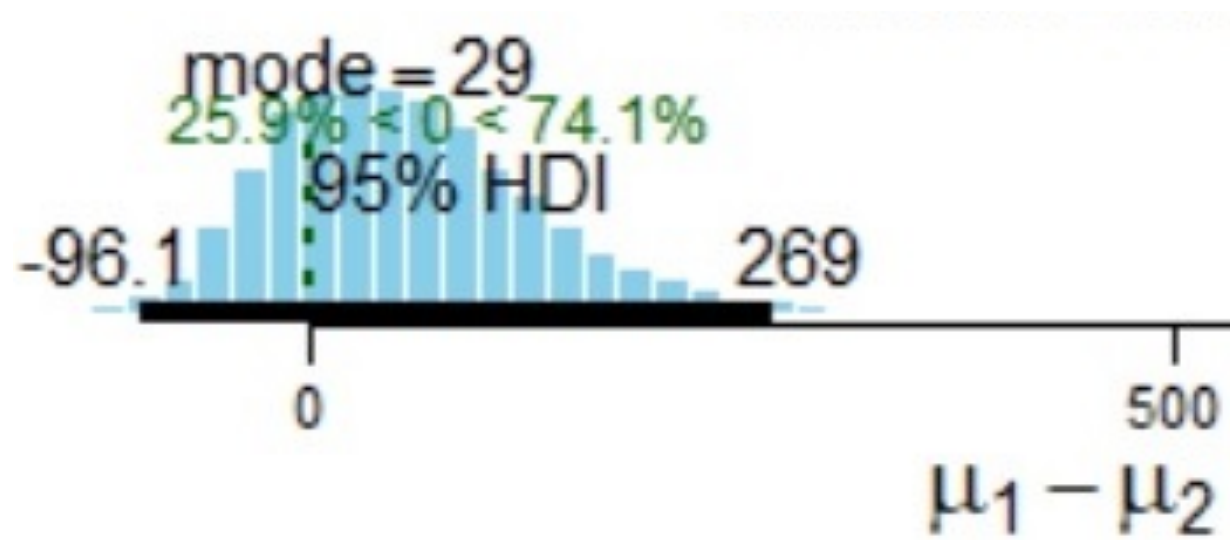


- Is our group the same?
 - Same function, same risk
- Is it just the pictures?
 - Different function, same risk
- Do people care at all?
 - Same function, different risk
- What if it mattered?
 - Different risk, different function

+ Same, Same ... Same

Play Store Rank and App Name	Downloads	Locks
1. Super-Bright LED Flashlight	38	5
3. Color Flashlight	34	5
2. Tiny Flashlight + LED	26	5
4. Brightest Flashlight Free	20	4
10. Flashlight Galaxy S7	16	5
9. Flashlight Galaxy	16	5
5. Brightest LED Flashlight	15	5
11. Flashlight	12	5
6. High-powered Flashlight	11	5
12. Flashlight Widget	7	5
7. FlashLight	6	5
13. Flashlight for HTC	5	5
8. Flashlight	3	5

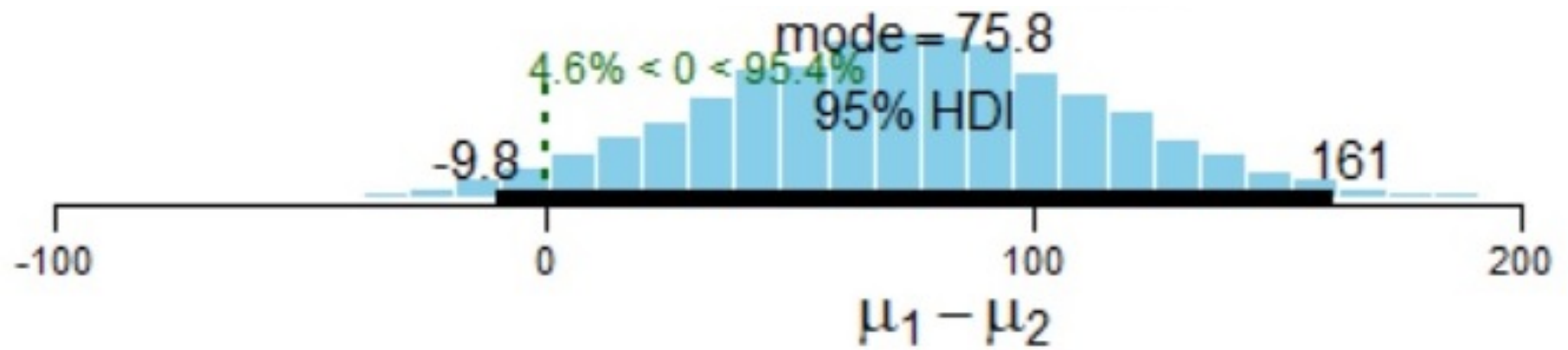
+ The Same



+ Different risks

Play Store Rank and App Name	Downloads	Locks
1. Weather - The Weather Channel	40	4
2. AccuWeather	31	5
5. Yahoo Weather	27	5
10. MyRadar Weather Radar	27	5
11. Weather Underground	19	5
6. Weather by WeatherBug	16	3
4. Weather & Clock Widget Android	14	4
6. Transparent clock & weather	11	3
12. NOAA Weather Unofficial	7	4
15. Weather Project	5	1
8. Weather, Widget Forecast Radar	3	4
14. Weather Project	2	1
13. iWeather-The Weather Today HD	2	1
3. Go Weather Forecast & Widgets	5	4
9. Weather	1	4

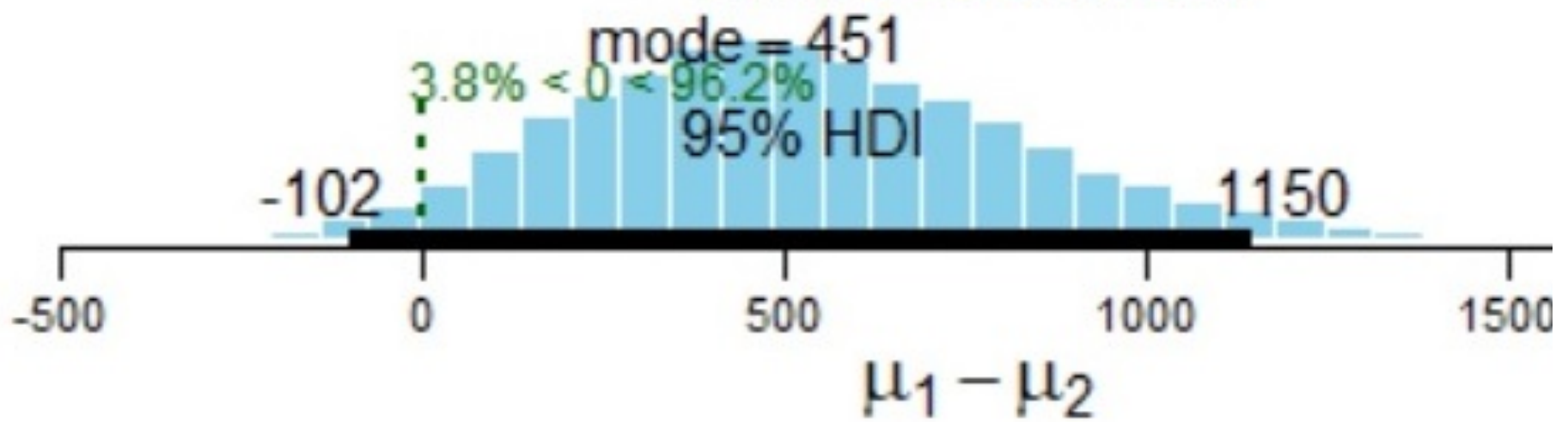
+ Different Risks: Weather



+ Different Functions

Play Store Rank and App Name	Downloads	Locks
1. Google Photos	39	5
8. PhotoDirector Photo Editor App	25	5
5. Photo Lab Picture Editor FX	24	5
9. Gallery	23	5
4. Photo Editor Pro	20	5
11. A+ Gallery Photos & Videos	19	5
5. Photo Collage Editor	17	5
3. PhotoGrid & Photo Collage	15	5
10. Toolwiz Photos - Pro Editor	13	5
6. Photo Editor Collage Maker Pro	9	5
2. PicsArt Photo Studio & Collage	3	3
7. Phonto - Text on Photos	1	5

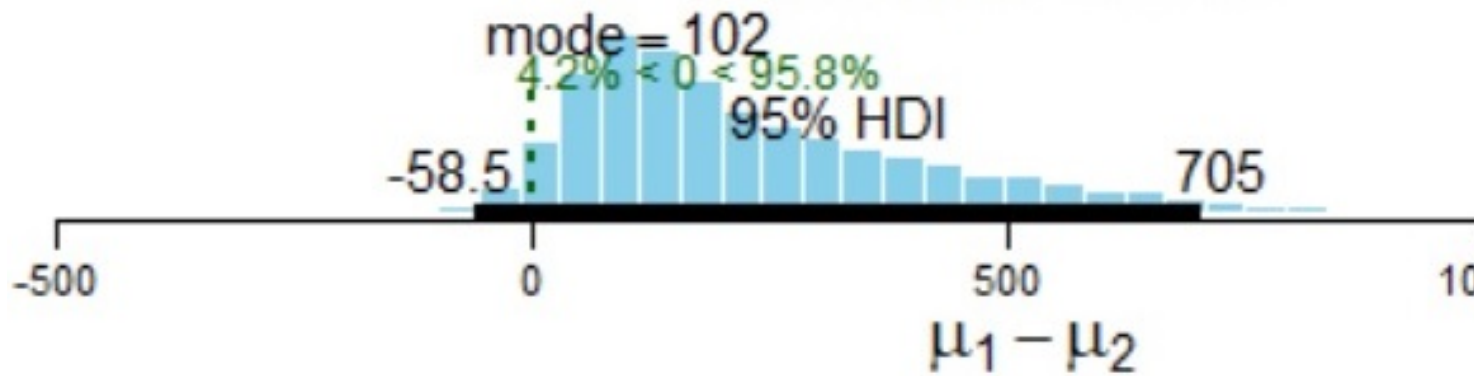
+ Photos



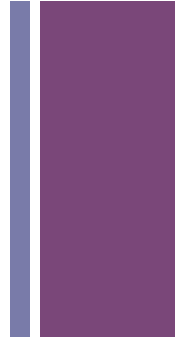
+ Very different: Games

Play Store Rank and App Name	Downloads	Locks
2. Fruit Ninja Free	39	5
1. Subway Surfers	23	5
8. Super Smash Jungle World	22	5
5. PAC-MAN	20	5
13. Wheel of Fortune Free Play	16	5
7. Color Switch	15	5
4. Piano Tiles 2™	15	5
3. slither.io	12	5
6. Rolling Sky	11	5
9. Block! Hexa Puzzle	4	5
10. Flip Diving	3	1
16. Battleships - Fleet Battle	2	5
11. Snakes & Ladders King	2	5
13. Board Games	1	5
14. Best Board Games	1	5
12. Checkers	1	5
15. Mancala	1	3

+ Different, delta: Games



+ Weighted Means



- Is our group the same?
 - Likely
- Is it just the pictures?
 - Unlikely
- Do people care at all?
 - Likely
- What if it mattered?
 - Still likely

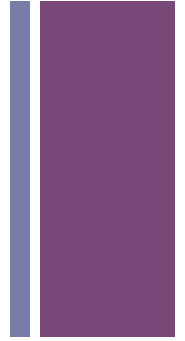


IoT

It's Obviously Terrible

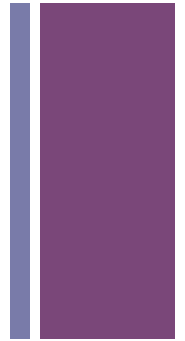
Give people controls
they can understand
and trust, for the
privacy and security
they want

+ Consumer Demand



- Address all three components
 - a usable interaction
 - with risk information
 - that leverages economic behaviors

+ Usable Information



Privacy Rating

4.0 Starting at: \$19.05

3.0 Starting at: \$13.59

2.0 Starting at: \$9.99

1.0 Starting at: \$6.99

Price: \$19.05 + shipping & tax

Privacy Rating

What is Privacy Rating?

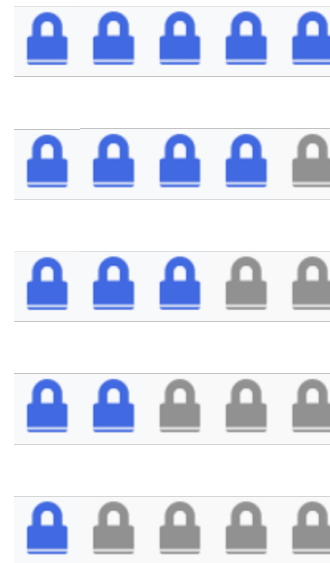
Smart devices use personal information. The pr...

Product Description

- Control app
- No hub required
- Set your schedule
- Share access
- Voice control with Amazon Alexa, Google Assistant & Microsoft Cortana.

Tabs with privacy and price information

Privacy Rating



More Privacy



Less Privacy

+ Endowment Effect

The image displays two side-by-side product listings for smart plugs, illustrating the endowment effect through different privacy defaults. Both listings feature a 'Privacy Rating' section on the left with four options (4.0, 3.0, 2.0, 1.0) and a 'Product Description' on the right. A blue box labeled 'Tabs with privacy and price information' points to the privacy rating sections of both listings.

(a) High Privacy Default

Privacy Rating	Starting at
4.0 (checked)	\$19.05
3.0	\$13.59
2.0	\$9.99
1.0	\$6.99

Price: \$19.05 + shipping & tax

Privacy Rating: 4.0 3.0 2.0 1.0

What is Privacy Rating?
Smart devices use personal information. The privacy rating indicates the level of protection for your personal information.

Product Description:

- Control any smart device with your smartphone
- No hub required
- Set your schedule
- Share access with family
- Voice control with Amazon Alexa, Google Assistant & Microsoft Cortana.

(b) Low Privacy Default

Privacy Rating	Starting at
1.0 (checked)	\$6.99
2.0	\$9.99
3.0	\$13.59
4.0	\$19.05

Price: \$6.99 + shipping & tax

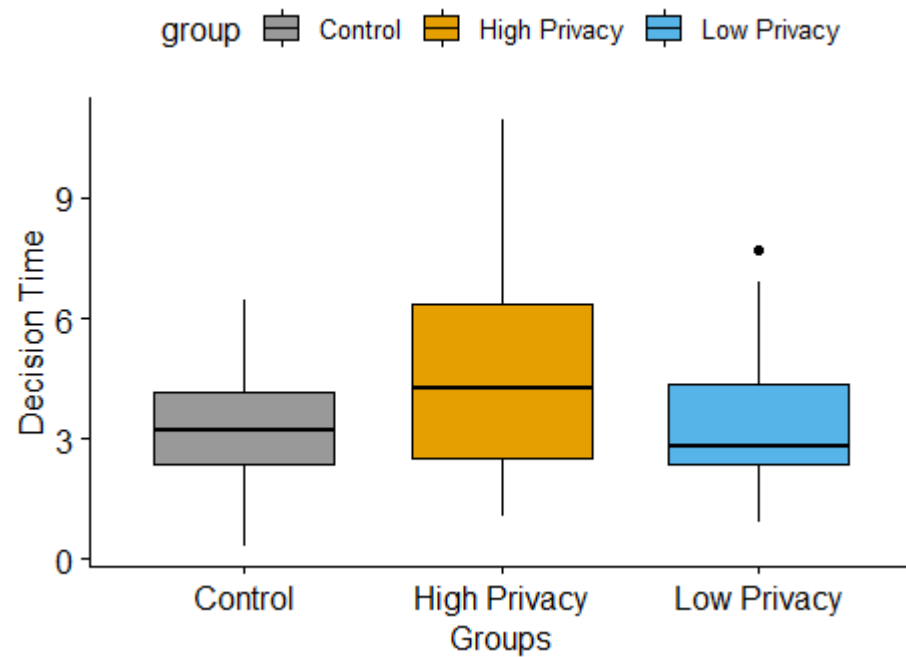
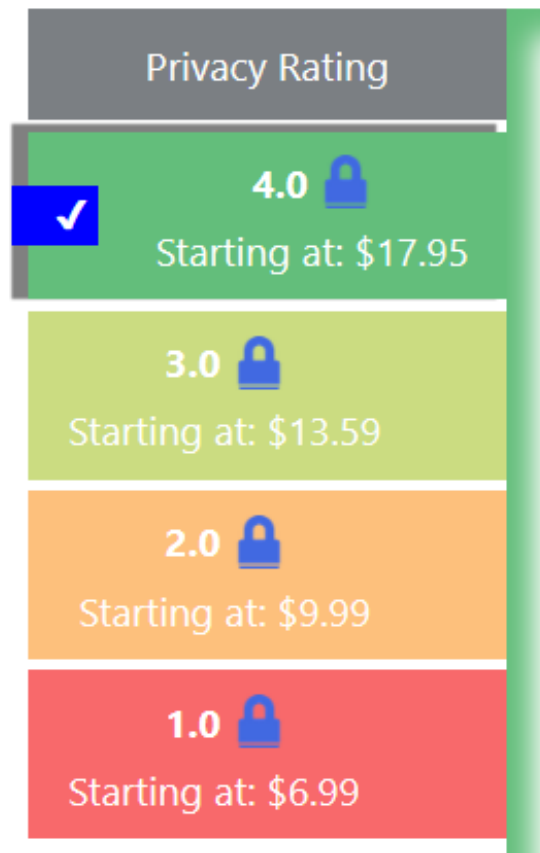
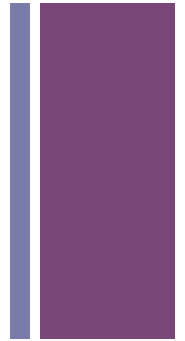
Privacy Rating: 1.0 2.0 3.0 4.0

What is Privacy Rating?
Smart devices use personal information. The privacy rating indicates the level of protection for your personal information.

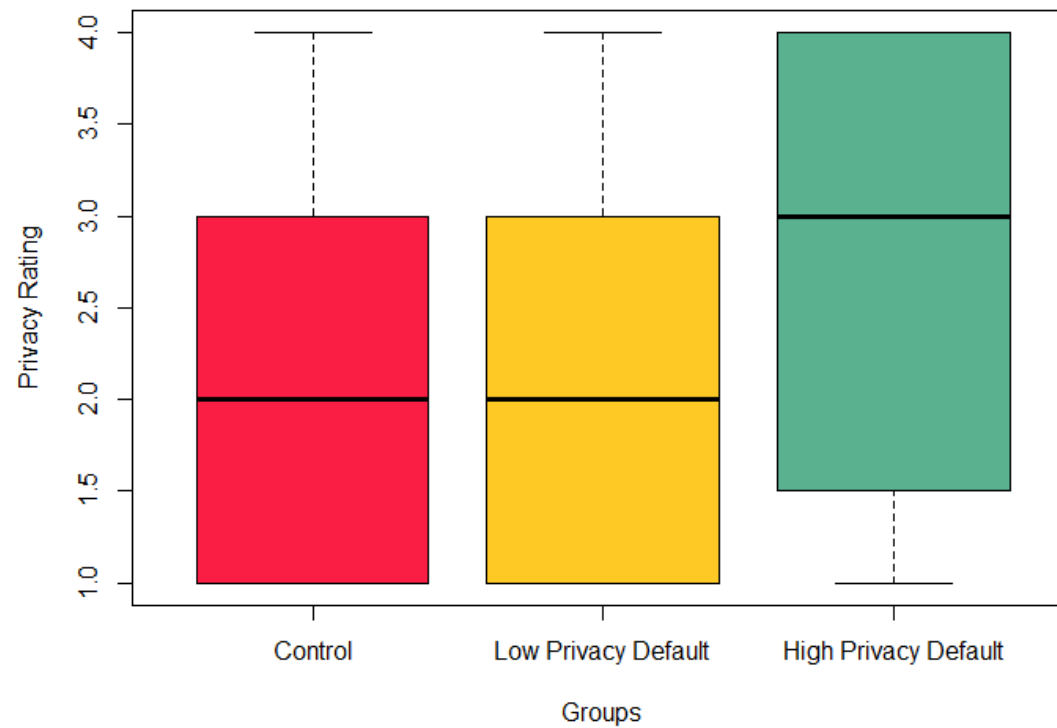
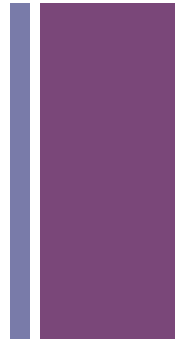
Product Description:

- Niusute smart plug supports Android and IOS operating system and activates, Easy to use
- Remote Control: You can control your lights and appliances connected to the Smart Plug from anywhere (Android or iOS 8.0 and higher). Control your devices globally with Wi-Fi access. No Hub Required
- Voice Control: Work with Alexa for voice control, instantly turn on or off devices by voice
- Schedule Automatically: Schedule the Smart Outlet to automatically power electronic devices on or off
- MULTIPLE USES: Power Saving: No longer need to worry about your electronic products being powered on when you are not at home

+ Easy to Use Information



+ Address All Three Dimensions



Why
What
How

+ Address All Dimensions

(c)

Privacy Rating

4.0	Starting at: \$19.05
3.0	Starting at: \$13.59
2.0	Starting at: \$9.99
1.0	Starting at: \$6.99

Geeni Spot Smart Wi-Fi Plug

Price: \$19.05 + shipping & tax

(a) Privacy Rating

(b) What is Privacy Rating?
Smart devices use personal information. The privacy rating rates how much data are collected, stored and shared as well as if the company is clear about its data use.

Geeni Spot Smart Wi-Fi Plug

Price: \$17.95 + shipping & tax

Product Description

- Control any plug in device from anywhere using the Geeni app (iOS 8 or higher/Android 4.1 or high
- No hub required, Wi-Fi built-in. Compatible with all 2.4 GHz Wi-Fi networks. Not compatible with 5G
- Set your schedule and automatically tailor your plugged in devices to perfectly fit your life.
- Share access and allow your spouse, roommates or visitors to access your devices.
- Voice control with Amazon Alexa, Google Assistant & Microsoft Cortana.

Buy

Diagram annotations:

- Arrows point from the privacy rating tabs to a box labeled "Tabs with privacy and price information".
- An arrow points from the privacy rating icons to a box labeled "Visual Indicator for Privacy".

Data subject chooses the level of data care.
Risk information communicated in icons and colors.
Easy to choose less risk

+ Security in IoT Major Stakeholders



+ Security in IoT Major Stakeholders



1

Understand
Risk



2

Mitigate
Risk



3

Communicate
Risk



Security is Risk

Usablesecurity.net

My Opinions Only



Making security that fits the user & the
occasion

+ Some Economics Papers

- K Benton, Martin Swany, and Jean Camp, Preventing Data Exfiltration via Political and Geographic Routing Policies, Telecommunications Policy Research Conference (Arlington, VA) 30 Sept. - 2 October 2016
- Zheng Dong, Kevin Kane, Siyu Chen, and L. Jean Camp, The New Wildcats: High-Risk Banking From Worst-Case Certificate Practices Online, Journal of Technology Science, April 2016
- P. Morano, L Jean Camp, Macroeconomic Analysis of Routing Anomalies, TPRC, (Arlington, VA) 2016.
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- D. Lui, Jean Camp, XWang, Using Budget-Based Access Control to Manage Operational Risks Caused by Insiders, Journal of Wireless Mobile Networks, Ub/Computing, and Dependable Apps , (1) 1: 29—45 (2010)
- Debin Liu, XiaoFeng Wang and L. Jean Camp, Game Theoretic Modeling and Analysis of Insider Threats, International Journal of Critical Infrastructure Protection, (2008) 1:75—80
- Alex Tsow, Camilo Viecco, and L. Jean Camp, Privacy-Aware Architecture for Sharing Web Histories, IBM Journal of Research & Development, IBM Systems Journal 3 (2007): 5—13.
- L. Jean Camp, Reconceptualizing the Role of Security User, Daedalus 140.4 (2011): 93—107.
- Vaibhav Garg, Thomas Koster and L. Jean Camp, Cross—country Analysis of Spambots, EURASIP Journal on Information Security, 20 October 2013, 2013:3 (doi:10.1186/1687—417X—2013—3).
- Zheng Dong & L Jean Camp, “The decreasing marginal value of network size”, ACM SIGCAS Computers & Society, Vol. 41 No. 1 (2011).
- Debin Liu, XiaoFeng Wang, and L. Jean Camp, “Security Risk Management using Incentives”, IEEE Security & Privacy, Vol. 9, No. 6: 20—28 (2011).
- Vaibhav Garg, Sameer Patil , Apu Kapadia, and L Jean Camp, Peer—produced Privacy Protection: A Common—pool Approach, The IEEE International Symposium on Technology and Society (ISTAS) (Toronto, ON) 27—29 July 2013.
- Zheng Dong and L. Jean Camp, “PeerSec: Towards Peer Production and Crowdsourcing for Enhanced Security” , HotSec (Bellevue, WA) 7 August 2012.
- Zheng Dong, Vaibhav Garg, Apu Kapadia and L. Jean Camp, “Pools, Clubs and Security: Designing for a Party Not a Person”, New Security Paradigms Workshop (Bertinoro, Italy) 19—20 September 2012.
- Vaibhav Garg & L Jean Camp, “Macroeconomic Analysis of Malware”, NDSS (San Diego, CA) 24—27 February 2013, extended abstract.

+ Mental Models Papers

- V. Garg, and L. Jean Camp, Heuristics and Biases: Implications for Security Design, IEEE Technology & Society, Mar. 2013.
- J. Blythe & L. Jean Camp, Implementing Mental Models, Semantic Computing and Security, An IEEE Symposium on Security and Privacy (SP) Workshop (San Francisco, CA) 24 May 2012.
- Vaibhav Garg, L Jean Camp and Kay Connelly, Risk Communication Design: Video vs. Text, PETS (Vigo, Spain) 11-13 July 2012.
- V. Garg, L. Huber, L. J. Camp, K. Connelly, Risk Communication Design for Older Adults, Gerontechnology Vol. 11, No. 2 (2012).
- L Jean Camp, "Mental Models of Privacy and Security," IEEE Technology & Society, Vol 28 (3) 37-46.
- V. Garg & L. Jean Camp, End User Perception of Online Risk Under Uncertainty, Hawaii International Conference On System Sciences, (Manoa, HI) 4—7 January 2012.
- J. Blythe, L. Jean Camp & V. Garg, Targeted Risk Communication for Computer Security, 2011 International Conference on Intelligent User Interfaces, (Palo Alto, CA) 13—16 February 2011.
- Farzeneh Asgapour, Debin Liu and L. Jean Camp, "Mental Models of Computer Security Risks", Usable Security 07, Financial Cryptography and Data Security Lecture Notes in Computer Science Volume 4886, 2007, pp 367—377.
- Allan Friedman & L. Jean Camp, "Making Security Manifest", Second Workshop on the Economics of Information Security, College Park, MA. May 2003.

+ Mobile Market Papers

- Benton, Kevin, L. Jean Camp, and Vaibhav Garg. "Studying the effectiveness of android application permissions requests." Pervasive Computing and Communications Workshops (PERCOM Workshops), 2013 IEEE International Conference on. IEEE, 2013. <http://www.ljean.com/files/AndriodEyeballs.pdf>
- Rajivan, Prashanth, and Jean Camp. "Influence of Privacy Attitude and Privacy Cue Framing on Android App Choices." *Workshop on Authentication associated with the Twelfth Symposium on Usable Privacy and Security (SOUPS 2016)*. USENIX Association, 2016.
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